Backus (H.)

To the Fellows of the Alabama State Medical Association:

The Essay on the "UNITY OF DISEASE," which the undersigned had the honor to read before the Association, December last, and which was published in the "Proceedings," is so obscured, by errors, partly original, partly typographical, as to be scarcely intelligible. In justice to himself, and subject, he has attempted, and he trusts, succeeded, in correcting numerous errors; and by additional illustrations, rendered it more complete and intelligible. As this will not interfere with the continuation of the subject, by appointment, at the next meeting of the Association, it is hoped that this re-publication will be acceptable to those to whom it is addressed.

H. BACKUS.

SELMA, ALA., April, 1853.

The Italics occurring in the quoted matter are my own. H.B.

The fundamental condition requisite to the developement, growth, and maintenance of an organised body exhibiting the phenomenon of life, is a constantly circulated supply of the materials of which it is composed.

The truth of this proposition appears in the fact, that all bodies, organic and inorganic, are built up by molecular condensation, aggregation, or arrangement. To condense, aggregate, or arrange these molecules into forms or bodies, involves motion, circulation. Again, every phenomenon exhibited by living beings, is at the expense of a disintegration of a portion of the tissue or organ exhibiting such phenomenon. *Somatic* life is at the expense of *molecular* death. We *live* by *dying*. Hence a necessity of a constantly circulated supply of materials for *reproduction*, *maintenance*. Molecular motion, then, is the type, the antecedent, the base of all forms, all motion or phenomenon, since molecular motion builds up, sustains, disintegrates or pulls down. To observation, the conditions of form, of phenomenon, are media of different densities acting upon each other, represented in air, water, and the earth. There must be resistance to motion, as a fulcrum for motion. This is no more paradoxical than that death is the condition or type of life, or that the invisible is the condition or type of the visible. It is the action, resistance, pressure of these different media upon each other, that exhibits form, phenomenon. Organic bodies, being specializations of inorganic bodies, the same conditions * of form, of phenomenon, obtain in them as in their type, viz: Media of different densities acting upon each other, represented in their solids, liquids, and fluids, or air in respiration. These conditions are universal;—they obtain wherever there is form or phenomenon; whether involving molecules or masses; wheth-

* It does not follow, that because, organic and inorganic bodies have certain conditions in common, that they do not differ from each other, and among themselves. All bodies have certain common properties, and it is with these, that we have at present to do. The principles or doctrines of medicine, are not so firmly established as to suppress all farther inquiry, and it is more in the light of suggestion, than positive assertion, that these views are offered; adopting the language of that admirable Philosopher and Physiologist, Dr. Carpenter, as expressed in his General and Comparative Physiology, p. 36. "In the consideration of this or any other Theory of Life, it is very important to keep constantly in view, that it has relation only to the agencies concerned in the formation and conservation of the *material* organism. The phenomena of *mind* belong to a category altogether distinct, and cannot be considered as bearing any necessary relation to tne former. It seems also necessary to point out, that in speaking of *forces* as possessing an absolute existence, it is not intended on the one hand to imply that they are any thing else than "affections of matter," * nor on the other to regard them in any other light, than as the direct operation of the primal all-sustaining Cause."

* See Grove on the "Correla tion of Physical Forces," p. 7.

er applied to absorption or circulation, voluntary or involuntary motion; the organic or inorganic world. They are the instruments, so to speak, in the hands of the Creator for the accomplishment of his great designs; they form the fundamental subtratum; the common condition, the unity of plan, lying at the foundation of all things; and equally the diversity of form, or phenomenon every where exhibited. Absorption of nutritive materials from the surrounding media, is the type of circulation, respiration. This being a general principle, its most simple and most complex specialization must rest upon it, these specializations being adaptive in character. The surrounding media, then, in furnishing the materials or conditions of absorption, furnish the materials or conditions of circulation. In other words, acquisition of materials *is* circulation, absorption being the type. Blood, i. e. water and other materials in suspension or solution, is an internal reflection, extension of its type, the external surrounding media. The vascular apparatus is an internal reflection, extension of its type, the external absorbing surface.—We have said that the conditions of absorption are, the action, resistance, pressure of media of different densities upon each other. Chemistry of Plants, by Dr. Draper, page 28, "From these simple principles we deduce the following important law—important because it gives us at once a clear explanation of the rise of sap in trees, and a beautiful exposition of the true cause of the circulation of blood; when two *different* liquids are brought in contact in a *porous solid*, which is wetted by both, but by them unequally, that one which has the greatest affinity for the solid, or which wets it most perfectly, will pass most rapidly through it, and may even drive the other before it." Page 40, "It is well known to physicians, from the phenomena of asphyxia, that whenever the admission of Oxygen into the air cells of the lungs is prevented, the circulation through them simultaneously stops; but it may be renewed again on the re-admission of that gas, provided it is within a short space of time, and recovery may and often does take place under these circumstances. What, now, is the cause of that asphyxiated condition? Why does the blood cease to flow? The chemical theory of the circulation through the lungs which I have just given, points to the oxydation of that blood as the very cause of its movement. It is the *pressure* of the *deoxydised* upon the *oxydised* blood that drives the latter along the pulmonary *veins* to the heart. But should any thing intervene to prevent that oxydation taking place, *no pressure*, and, therefore, *no movement can* ensue."

It is the *pressure* of these media of different densities upon each other, then, that is *the* cause of the movement or circu-

lation of blood. Absorption being the type of circulation, and the conditions of absorption being pressure of media of different densities upon each other, it follows that the conditions of circulation are the same, represented in the pressure of the heart upon the blood. The pressure of the surrounding media, together with that exerted by air in respiration, food and water, i. e. blood, their internal reflections, is the type, the antecedent, the fulcrum of the returning pressure of their condensation, specialization into tissues upon them. Air, blood, and the solids of the body may be said, severally, to form one third of a heart; the same action, resistance, pressure of these different media that circulates the molecules, air and blood, circulates the solids, or the mass; the molecular circulation being the antecedent, the base of the circulation of the mass. Was it not for the antecedent molecular motion or circulation of air, our bodies, like the earth, would be impaled as it were in a heaven of brass. Was it not for the antecedent molecular motion or circulation of blood, our muscles would be as rigid as *iron*. The pressure of the air is to the circulation in general what the pressure of the bandage is to the circulation through a varicose limb. The bandage does not increase the pressure of the heart, but the influence of *both* being that of *pressure*, it is an additional heart, or as a heart itself to the circulation through that limb. This may be seen by placing a limb in an exhausting receiver, and unloosing, removing these molecular bandages or hearts of air. The cupping-glass is a familiar local illustration.

How admirably adapted to support the delicate vessels of the lungs, to circulate the blood through those vessels, are these elastic bandages of air. The blood may be said to circulate through its type, *tubes* of air, and by its type, *hearts* of air. What a union of types; acquisition of materials, Oxygen, here as elsewhere, *is* circulation; absorption being the type.

The increased pressure of water over air, is a bandage or counter heart to the body of the fish, the fœtus. When the firm fulcrum of the surrounding media is removed from the small heart of the fœtus in birth, its large respiratory heart is evolved in its stead, the first to beat, literally throbbing and beating on and through its type, air.

This may be seen in our efforts to revive the still born. All our efforts are directed to excite the pulsation of its respiratory heart; all other means failing, we artificially *dilate* it with air, its permanent fulcrum of motion; the returning pressure of its parieties alternating its movements.

The increased density or pressure of the earth over water, is a bandage which the God of Nature binds around the roots of the tree; absorption, its own movements in extension, its

waving leaves, branches, and trunk, in the winds or bandages of heaven, these are its hearts.

The influence of a dense medium in the circulation of liquids may be seen in the arteries, capillaries, and veins; in the experiments of Dr. Williams with rigid and membranous tubes; or, when we make our foot-steps on the yielding sand.

The only influence of the heart in the circulation of blood, is that of mechanical pressure. It contracts upon its contents, i. e. it returns upon its type, the antecedent pressure of blood, its molecular surrounding media. Carpenters General and Comparative Physiology, page 696. Note.—To use the language of Dr. Grant, "It is the restless activity of the Worm and of the Insect, that makes every fibre of their body as it were a heart to circulate their blood, and propel their fluids. They require no complicated apparatus to accelerate the ever active current of their blood, and hence the imperfect developement of the great centre of their vascular system. Indeed it has been shown by Ehrenberg and by Nordmann, that in the simplest of these animals, the trematoid Entozoa, the blood flows through the system by the mere motions of the body, without the least motion or impulse of the vessels which contain it." Reflect this extract upon man, the highest specialization of organised bodies, and it is equally true of him, that every fibre of his body is a heart to circulate his blood, his own heart being in the condition of the worm, *circulating its own blood by its own movement.* So with all moveable parts, and the immovable parts, the solid frame-work of his body, affords by its resistance, like the earth to his feet, a firm fulcrum or counter heart to the moveable parts. This may be seen in the paralysed limb; it becomes atrophied from loss of its general heart, *its own movements;* restore this general heart through artificial exercise, and its nutrition is restored.

The nervous mass introduces no element of force not found in its molecular surrounding media, heat, light, electricity, or some modification of molecular motion not differing more from those than they do from each other. Dr. Carpenter, in his great work on General and Comparative Physiology, says, that physical and vital forces are correlated; that the germ cannot develope itself into the cell, all other conditions being present in the absence of heat; that heat acting through organised matter becomes itself the formative force; and that the vital force is itself dependent upon the preceding nutritive operations. Now, if nutritive operations precede the vital force, and these nutritive operations cannot take place in the absence of heat, it is not necessary to assume the existence of such a force, if it differs from heat. Heat, light, and electricity are quite as mysterious in themselves as the vital force, supposing it to be something different.

Sensation, common or special, is elicited by pressure, molecular touch, motion How delicate, how refined is the molecular touch of summers gentle breeze; of light, of sound, of taste, of smell; how admirably adapted are the nervous molecules to appreciate, distinguish this attenuated touch.

Sensation may be said to be elicited solely by the pressure of the surrounding media. Since the pressure of blood, which is but an internal reflection of that surrounding media, elicits the sensations ascribed to internal causes, pleasurable or painful, according to degree.

Man, then, may be said to mirror the external world; to be an internal reflection of the surrounding media, returning upon themselves to themselves; the physical Universe in minature, with all its conditions of form, of phenomenon, the illimitable heavens twinkling in thought, a type of his mind.

Disease is obstructed circulation, a disturbance of the fundamental condition laid down in our first proposition, a loss of equilibrium in the action, resistance, pressure, of the different parts, solids and fluids upon each other and the surrounding media, illustrated in disease of the heart.

The positions which we shall attempt to establish in illustration and confirmation of the truth of our general proposition, that disease is a unit, obstructed circulation, are, 1st, that prostration is the antecedent, the fulcrum of reaction; 2d, that this state of prostration is the only essential condition in disease; and, 3d, that whatever reaction contributes to disease, is the same in kind with its antecedent.

It will be observed that we are not attempting to prove unity in names, or in what are called exciting causes, nor of locality, in disease. We attempt to go deeper into the nature of the subject than mere names frequently import. We affirm that wherever there is *disease*, there is a *common state* or *condition*, differing only in degree; rejecting in toto the doctrine of plurality of causes or conditions producing the same results. It is said that many causes produce motion, sensation, heat, death, &c. We have said that the conditions of motion, whether of molecules or masses, were media of different densities acting upon each other; that molecular motion was the type, the antecedent, the base of the motion of the mass; that these conditions were *common*, not only wherever there was motion, but form, or phenomenon, as heat; that sensation common or special, was elicited solely by pressure, molecular touch; that disease or death was obstructed circulation.

The different causes of death, as they are called, all produce one common state antecedent. To illustrate, the circulation may be arrested through the system or a part, by the application of a cotton, silk, flax, leather, or wire ligature to the vessels. These ligatures, like the exciting causes of disease or

death, may, and do differ from each other, or among themselves, but they are not *different causes* of the arrested circulation; they obstruct the circulation by virtue of one *common* element, viz: *pressure.* Anemia and Plethora, two opposite conditions, as they are called, produce the same result, convulsions for instance. Now, although a plethoric man may have more flesh and blood than an anemic one, though one may have a strong, and the other a feeble pulse, and though they may both have convulsions, it does not follow that the conditions upon which the convulsions depend are different. In the anemic case, or where the pulse is feeble, the convulsion depends upon *retrograde pressure* of *venous blood*, while in the other case, there is added to this retrogade pressure of venous blood, the arterial vis-a-tergo or pressure of re-action. This is frequently illustrated, especially in children, in ague and fever. We sometimes see convulsions in the cold stage, or stage of prostration, from this retrograde pressure of venous blood. This pressure not being sufficient in certain cases, we have the convulsions in the stage of re-action. In fact, the involuntary tremor in ague, is as pure *convulsion*, as the most terrific that goes by the name, having the same cause, and differing only in degree. This will be more clearly illustrated when we consider disease of the heart. In order to establish the truth of our first position, it is not necessary that every case should sink into extreme prostration, preceding re-action. There are degrees here as elsewhere. As this position is admitted in general, it falls upon those who hold that there are exceptions to its universal application, to bring forward a case, in which they have witnessed every step of the transition from a state of perfect health to that of disease, fever, or inflamation, where this state of prostration was absent. The testimony of the patient, of his friends, or the imperfect observations of a physician, cannot be admitted against the general admissions, upon this point, of the profession. The terms prostration, debility, collapse, shock to the nervous system, want of power, depression, dilatation, congestion and obstruction, are here used as synonymous; different terms merely for the same state, or differing only in degree. The first argument adduced in support of our first position, is founded upon the term *re-action.*

Re-action, implies a *state* of *previous prostration* to *re-act* from, and this, whether involving the smallest surface in local *inflammation*, or spread over the system in *fever.* Cyclopedia Pract. Medicine, Vol. 1. p. 454.

"Caloric, or heat as it is commonly called, acts as a stimulant when applied to the animal body, its effects being local or general according to the extent and degree of its application; it increases, like most other stimulants, the action of

the heart and blood-vessels; but as is also the case generally with stimulants, a *secondary* effect occurs, which consists in a *collapse*, or in an action lower than that which is natural, after the excitement has subsided; effects exactly the reverse of these take place from the abstraction of caloric, or, to use the common phrase from the application of cold. Heat is therefore a stimulant and cold asedative. Page 456, "But the injury sustained from exposure to cold is not always dependent on its *direct sedative* action, for it may produce (aggravate) disease and even cause death, by that secondary effect which is denominated *re-action;* this re-action *after depression* consists in the return of the action of the vascular system; if moderate it may go little beyond the natural degree. But when the re-action is great, the vascular excitement is so increased beyond due bounds, as to constitute *fever;* and perhaps there may be in reality no difference in this state of the body and fever from other causes. The symptoms are often the same and sometimes last as long. Fever is not the only consequence to be feared from re-action after exposure to cold; local *inflammations* may follow this general reaction and any of the internal membranes or organs may become the seat of inflammation." These extracts illustrate this important point—that these agents, stimulants and sedatives, produce a common condition, viz: a state of collapse, or an action below the natural standard, secondarily in the case of stimulants and primarily in the case of sedatives, which *common condition* we define to be disease. Williams principles of medicine, page 152, "*Malaria*, and the influences which produce *continued* and *exanthematous* fevers, seem to have the *same effect as external cold*, but it is not so easy to explain how they operate. The cold stage of these diseases exhibits in a high degree the marks of intropulsive congestion, and it is well known that in ague, the congestive enlargement of the liver and spleen are among its most remarkable phenomena. The *congestions remaining* during the *febrile* stages of *fevers*, seem to be the chief *causes* of their *inflammatory* complications." Cyclopedia Pract. Med., Vol. 3, page 556, "We have stated that absolute plethora was the parent of pure inflammation. *Previously* to the occurrence of *febrile* or *inflammatory* action there is *always* a sensible interval of *disease* marked by *diminished power* in the *arterial system*, the oppressed and irregular actions of which evince its inadequacy to carry on the circulation with its wonted vigor. The pulse, *if examined*, will be found low, oppressed, irregular, which state passes progressively into one of increased action or fever. *Multiplied* observations have satisfied us both that the stage of disease here mentioned *precedes* that of *febrile* action, and that the morbid actions indicated by the

pulse *succeed each other in the order here mentioned*, the *first* being that of *feebleness*, the second of irregularity, and the third of permanently quickened action. Druitt's Surgery, 1st chap. "As the most proper commencement of a systematic treatise on Surgery, we shall begin by describing a *state* commonly known as *prostration*, collapse, or shock to the nervous system, by which *terms* we *signify* that *general depression* of the actions and *powers* of life, which immediately follows any severe injury. Exciting causes. Great and sudden extremes of grief, or joy, or fear, or cold;—large doses of any active poison, such as Arsenic, Sulphuric Acid, or Tobacco; the sudden impression of Miasmata, or of morbid poisons, as the plague; great loss of blood and mechanical injuries." We have here enumerated almost all the recognised exciting causes of disease, and, like the ligatures, they produce a *common state*, or condition. "The process of recovery from collapse is commonly called *re-action*, and the manner in which the case may terminate must depend upon the nature and *degree* of that re-action. Thus, first. If it be healthy and moderate, and especially if the collapse arise from concussion or violent shaking of an organ without actual injury to its structure, it will lead to complete recovery. Secondly, if re-action be excessive, the *state* of *collapse* will be gradually *succeeded* by *fever*, symptomatic of the local *inflammation* to which the injury has given origin. Thirdly, if re-action be imperfectly developed, it will be converted into the state of *prostration with excitement, &c.* Fourthly, if re-action be *altogether wanting*, the *collapse* will *terminate* in *death*."* It will be seen that while all the extracts we have made from these standard authors fully and amply sustain our first position, they do much more. They are equally to the point, in proof of the unity of fever and inflammation, since both are here seen to have the *same antecedents.*

This is also seen in the argument of Dr. Wood, who takes somewhat different views upon this subject, from those here advocated. Woods' Practice, vol. 1, p. 45. "Hence, consequently, the *congestion* which is *always* the *first observable* change in that series of changes which constitutes the process of *inflammation.*" Page 79, "The *general depression* which often

* The following quotation from Cullen, first lines, page 37, (which was inadvertently omitted) is so directly in point, that we must introduce it as a Note. "It is therefore evident that there are three states which *always* take place in *fever;* a state of *debility*, a state of cold, and a state of heat; and as these three states *regularly* and *constantly succeed* each other *in the order* we have mentioned them, it is presumed that they are in the series of *cause and effect* with respect to one another. This we hold a matter of *fact*, even although we should not be able to explain in what manner, or by what *mechanical* means these states severally produce each other." His subsequent hypotheses of "spasm of the capillaries," whether true or not, does not effect the statement of *facts* up to that point.

ushers in fever, bears to it the *same relation* as the *local depression* bears to the *subsequent inflammation.*" The symptoms of inflammation, heat, redness, pain and swelling, are common to fever, but being diffused over a larger surface, may not be so prominent in every part. To complete the analogy, we quote from the Cyclopedia Pract. Med., 2d vol., p. 751, "*Inflammation* may be *continued, remittent* or *intermittent.*" Fever and inflammation, then, are but different terms for the same state, differing only in extent or degree.

Our second position is, that this state of prostration or congestion, is the only essential condition in disease. We have seen from Mr. Druitt, that if re-action be altogether wanting the collapse will terminate in death. It is conceded that prostration, debility, congestion, or retrograde pressure of venous blood, is the only essential cause of flux, hemorrhage, dropsy, pain, convulsion, coma, ulceration, mortification or death, or may be conceded on reference to dilatation, or valvular disease of the heart.

Our third position is, that whatever re-action contributes to disease is the same in kind with its antecedent. This will be illustrated when we consider hypertrophy of the heart.—Dilatation of the heart corresponds to the state of prostration preceding re-action, fever or inflammation. Dilatation *is* prostration, debility, want of power, congestion or obstruction. Dilatation i. e. prostration, is the antecedent, the fulcrum of hypertrophy, i. e. re-action. Hypertrophy is *chronic* re-action. Re-action is *acute* hypertrophy. Sometimes we have no hypertrophy; sometimes we have no re-action; the cause and the effect, is the same. Sometimes we have a low form of fever, of inflammation, (the state of *prostration with excitement* spoken of by Mr. Druitt.) This is represented in dilatation with hypertrophy, dilatation predominating. Sometimes we have active fever, inflammation, this is represented in hypertrophy with dilatation, hypertrophy predominating. Without resolution of fever, of inflammation, at the point of obstruction we have degeneration. Valvular disease representing this point, *is* degeneration. The heart and the capillary reflect their condition in disease, upon each other. The heart and its force, being a condensation of capillaries and their forces, it follows, that the mass, the heart, in disease, brings into sensible view, or repeats in a sensible form, the condition in disease of its molecular, capillary type. Hope on the heart, p. 298, "The causes of dilatation, are, 1st, *deficient power* of the heart, whether congenital or acquired in proportion to the system; 2d, in general terms, *all obstructions to the circulation*, whether situated in the orifices of the heart, or in the Aortic, or pulmonary system." Now, if we consider *deficient power* as *itself* a *mechanical obstruction*, and which Dr.

Hope has well illustrated, by comparing it to weakness in the main-spring of a watch, retarding its movements, we have but *one cause*, thereby *demonstrating* unity in the disease.—This is seen in the following extract, same page, "Dilatation of the heart is a *purely mechanical effect of over distension.*—Blood *accumulated* in its cavities exerts a *pressure* from the centre to the circumference in every direction; and when once it surmounts the *resistance* (counter pressure) offered by the contractile and elastic *power* of the *parietes*, these necessarily yield and undergo *dilatation.*"

Reflect these extracts upon the capillaries, those molecular hearts, and we have the cause, and its mode of operation, in disease. This state exhibits the list of what are called *passive* diseases. Page 252, "The reader must here again be reminded that the exciting causes of *hypertrophy*, are equally those of dilatation; and that supposing no unknown agencies to interfere, as may sometimes possibly happen, it depends on the proportion which the cause (pressure) bears to the re-acting energy (pressure) of the cavity exposed to this influence, whether that cavity become affected with *hypertrophy*, *dilatation*, or a *combination* of the *two.*" Page 244, "In the same way, whether from *mechanical obstruction*, or *any other* cause, *blood* is *inordinately accumulated* in the *heart*, the organ is *provoked* to *extraordinary efforts;* it *struggles* against the *obstacle;* it frets and labors to overcome it; the corronary arteries are excited, to increased activity; augmented nutrition (hypertrophy) ensues." Reflect these extracts upon the capillaries, and we have the cause, and its mode of operation, of increased action, re-action, hypertrophy, fever or inflammation. This state, co-operating with its antecedent state of prostration, or dilatation, i. e. retrograde pressure of venous blood, exhibits the list of what are called *active* diseases.

It matters not where the obstruction is situated, whether in the heart, arterial, or pulmonary system. Page 251, "Obstruction in the right auricle, whether from this (obstruction in the lungs operating in a retrograde course, through the right ventricle) or *any other cause* (as debility) presents an *obstacle* to the *return of the venous blood*, and therefore causes retardation throughout the whole venous system; nor is this all; for the retardation is propagated through the capillaries to the arterial system, and thus at length returns in a circle to the heart. In this way may be explained what at first seems an anomaly; namely: that the left cavities are sometimes rendered hypertrophous by an obstruction situated behind them in the course of the circulation; as for instance, when the left ventricle is rendered hypertrophous by a contraction of the mitral orifice." Now as it is the retrograde pressure of venous blood propagated through the capillary

and arterial systems in a circle to the heart, which is the antecedent, the fulcrum of the returning pressure of the heart in re-action or hypertrophy upon it; and as this retrograde pressure is brought into operation in dilatation, i. e. prostration, it is seen how the state of prostration produces re-action, fever, or inflammation. It is also here seen that there may be hypertrophy without any of the recognised mechanical obstructions, as valvular disease, &c.; thus corresponding with the researches of Dr. Glendinning.

Page 254, "M. Bertin has the merit of having been the first to display in a clear light, the essential pathology of hypertrophy. His distinguished talent for generalization, however, has, I believe it will be allowed carried him a degree too far. He contends that authers are wrong in having assigned to hypertrophy as its symptoms, dyspnea, suffocation, violent injection of the face and of the venous capillaries in general, passive hemorrhages, and serious infiltration. He contends that these are the signs, not of hypertrophy, but of a co-existent lesion; viz: a contracted orifice, or any other affection capable of obstructing the circulation; and that pure uncomplicated hypertrophy is characterised by signs of increased energy of the circulation, instead of by dropsy, and the other signs of its retardation. That this is true in reference to the pure uncomplicated form of the disease, before embarrassment of the capillary circulation has taken place, will not be denied by any one who has had opportunities of verifying the symptoms by dissection. But M. Bertin is not in my opinion supported either by sound observation or analogy, when he says that serous infiltration and the whole class of symptoms bespeaking an obstructed circulation, are totally foreign and repugnant to hypertrophy. The truth, I believe to be, that the very same energy of the circulation which gives rise, as he admits, to active hemorrhages, apoplexy, &c., produces as its next effect, and in the more advanced stages of the disease, engorgement of the arterial capillary system; the necessary consequence of which is, serous infiltration and more or less of all the symptoms indicative of retardation of the blood." It will be seen that Dr. Hope takes the position, that an hypertrophied heart, can, by its own increased force, so engorge the capillaries, as to give rise to all the symptoms of an obstructed circulation. As this is the pivot on which the whole controversy turns, we give the opinions of others upon this point. Hope on the heart, page 19, "Laennec, and his predecessors have assigned to diseases of the heart a certain series of symptoms, which they believed to be common to the whole; but they had not analysed those symptoms, and ascertained which were peculiar to, and pathognomic of, the several affections taken individually. M. M. Bertin and Bou-

illaud, both writers of high talent, made this attempt, and with partial success; but the spirit of generalization (if I am correct in my own views) carried them a grade too far.—What observation leads me to regard as an inaccuracy, constitutes the very hinge of their work, the pivot on which turns the principal train of their reasoning; namely, that the symptoms of a retarded circulation are, UNDER ALL CIRCUMSTANCES, THE RESULT OF A MECHANICAL OBSTACLE TO THE COURSE OF THE BLOOD; that when for instance, they accompany hypertrophy or dilatation, they are not consequences of these affections, but of some co-existent mechanical obstacle, as a contracted valve, an aortic aneurism, &c. I have attempted to show, not only that hypertrophy, dilatation and softening can of themselves, respectively occasion the symptoms in question; but that these symptoms are seldom produced in any very remarkable degree of severity by a mechanical obstacle, unless hypertrophy, dilatation, or softening of the heart is superadded."

In differing from Dr. Hope on this particular point, it will be seen that I have strong support. My reasons are first, that according to his own showing, *these several affections of the heart are themselves symptoms or phenomena of an obstructed circulation*, and, therefore, cannot be the cause of the other symptoms of an obstructed circulation which occur in their history; that the very existence of hypertrophy, is proof positive of an antecedent dilatation, congestion, or obstruction as its fulcrum; that like its type, re-action, it implies this antecedent state; though when existing, these several affections re-act upon their original, giving prominence to those symptoms.—Second, the molecular or capillary circulation is the antecedent, the base, of the circulation of the mass, the heart.

One more quotation in general illustration and confirmation, and I have done. Page 255, "It must be admitted, however, that hypertrophy does not produce serous infiltration so readily and promptly as a direct primary obstacle to the return of the venous blood; a fact which admits of a rational and obvious explanation. When there is an obstacle to the return of the venous blood, suppose, for instance, contraction of the tricuspid, pulmonic, or mitral orifice, two causes, conspire to produce the capillary congestion, namely, the direct pressure of the arterial vis-a-tergo, and the retrograde pressure of the retarded venous blood. But when the latter pressure does not exist, when the veins freely receive and transmit their natural proportion of blood, the force of the arterial circulation must be very greatly increased before it can so far overcome the elasticity of the capillaries as to give rise to engorgement and infiltration."

From all that has been said, it appears that these several affections of the heart, together with all the symptoms, or con-

ditions that arise in their history, must take their places among the phenomena of an obstructed circulation, thereby declaring, unity in disease.

These several affections of the heart illustrate the great general truth of unity of plan, with diversity of form; they all being produced on the same general plan, yet exhibiting great diversity of form.

If all that has been said be true, man is still quite as mysterious in himself; exhibits quite as much goodness, wisdom and power in his Creator, as before.

Nay more; if it be admitted that man's physical frame is constructed upon purely mechanical principles, and governed by mechanical laws, such wonderful mechanism, such admirable adaptation, such evident design, literally requires, demands, demonstrates an Infinitely Wise, Good, and Powerful God, as his Creator.

If this paper possesses any value, it is only because it is founded upon the best established principles of Medicine. If it be true, it is only because the present state of Medicine, is ready for generalization. We do not pretend to add to the original materials, nor develope new methods of investigation. How far we have been successful in merely generalizing the facts already known into a comprehensive Science, is left to the respectful consideration of an enlightened Profession.